POWER SYSTEM FREQUENCY AND TIME ERROR MONITORING

August 2012

PREPARED BY:	System Performance and Commercial
DOCUMENT REF:	SP&C_01
VERSION:	1.0
DATE:	19 September 2012

FINAL

Version Release History

VERSION	DATE	BY	CHANGES
1.0	19/09/2012	Peter McEniery	Initial release

Contents

1 Disclaimer

This document is made available to you on the following basis:

a) ***Purpose*** - This report has been prepared by the Australian Energy Market Operator Limited ***(AEMO)*** for the sole purpose of complying with clause 4.18.15 of the National Electricity Rules in the context of events where power system frequency was outside the limits specified in the power system security and reliability standards.

b) ***No Reliance or warranty*** – This report contains data provided by third parties and might contain conclusions or forecasts and the like that rely on that data. This data is included "as is" and might not be free from errors or omissions. While AEMO has used due care and skill, AEMO does not warrant or represent that the data, conclusions, forecasts or other information in this report are accurate, reliable, complete or current or that they are suitable for particular purposes. You should verify and check the accuracy, completeness, reliability and suitability of this report for any use to which you intend to put it, and seek independent expert advice before using it, or any information contained in it.

c) ***Limitation of liability*** - To the extent permitted by law, AEMO and its advisers, consultants and other contributors to this report (or their respective associated companies, businesses, partners, directors, officers or employees) shall not be liable for any errors, omissions, defects or misrepresentations in the information contained in this report, or for any loss or damage suffered by persons who use or rely on such information (including by reason of negligence, negligent misstatement or otherwise). If any law prohibits the exclusion of such liability, AEMO's liability is limited, at AEMO's option, to the re-supply of the information, provided that this limitation is permitted by law and is fair and reasonable.

2 Introduction

AEMO must use reasonable endeavours to maintain the power system frequency and time error within the limits specified in the Frequency Operating Standards determined for the Mainland and the Tasmania Region by the Reliability Panel. This document reports on the frequency and time error performance observed during August 2012 in all regions of the NEM. Queensland, New South Wales, Victoria and South Australia are referred to as the Mainland regions throughout the report.

The Frequency Operating Standards for the Mainland regions and the Tasmania region are available on the AEMC web site[1].

The "Power System Frequency and Time Deviation Monitoring Report – Reference Guide[2]" outlines the calculation processes used by AEMO in the preparation of the monthly Power System Frequency and Time Deviation Monitoring reports.

The analysis of the delivery of Slow Raise service, Slow Lower service, Delayed Raise service and Delayed Lower service presented in this report are based on 4-second definition data. Unless otherwise noted, frequency data for Mainland regions is sourced from 4-second measurements in New South Wales and frequency data for Tasmania region is sourced from 4-second measurements in Tasmania. The analysis of Fast Raise service and Fast Lower service delivered is based on high-speed (50 millisecond or higher definition) data from Market Participants and is only presented in this report for events where the appropriate data is available.

3 Operation in the Normal Operating Frequency Band

During August 2012 the Mainland Frequency was within the Normal Operating Frequency Band (49.85 Hz – 50.15 Hz) 99.99% of the time.

During August 2012 the Tasmanian frequency was within the Normal Operating Frequency Band 99.93% of the time.

All frequency excursions within the Normal Operating Frequency Excursion Band (49.75 Hz – 50.25 Hz) returned to the Normal Operating Frequency Band within the times in the Frequency Operating Standards.

4 Operation outside the Normal Operating Frequency Excursion Band

Table 1 summarises events in the Mainland and Tasmanian regions for the month August 2012 with frequency excursions outside the Normal Operating Frequency Excursion Band.

All events in Table 1 were consistent with the Frequency Operating Standards.

[1] The Frequency Operating Standards for the Mainland and Tasmania regions are available from http://www.aemc.gov.au/Panels-and-Committees/Reliability-Panel/Guidelines-and-standards.html
[2] The Power System Frequency and Time Deviation Monitoring Report – Reference Guide is available from http://www.aemo.com.au/Electricity/Market-and-Power-Systems/NEM-Reports/Power-System-Performance-Monitoring

5 Events outside the Normal Operating Frequency Excursion Band

Table 1: Events in the Mainland and Tasmanian regions with frequency excursions outside the Normal Operating Frequency Excursion Band.

EVENT	LOW/HIGH FREQUENCY EVENT	NUMBER OF EVENTS	
		MAINLAND	TASMANIA
No contingency or load event/Normal event	LOW	0	0
	HIGH	0	0
Load Event	LOW	0	15
	HIGH	0	16
Generation Event	LOW	1	2
	HIGH	0	0
Network Event	LOW	0	0
	HIGH	0	0
Separation Event	LOW	0	0
	HIGH	0	0
Multiple Contingency Event	LOW	0	0
	HIGH	0	0

6 Events that did not meet the Frequency Operating Standards

No events in either the Mainland or Tasmanian Regions exceeded the Frequency Operating Standards during August 2012.

7 Accumulated time error

The Frequency Operating Standards require that the accumulated time error be maintained within the range ± 5 seconds in Mainland regions and ± 15 seconds in Tasmania. Constraints used to control accumulated time error are based upon measurements taken in Queensland, New South Wales and Tasmania. The range of accumulated time error recorded for these measurements in August 2012 is provided in Table 2.

Table 2: Accumulated time error measurements in August 2012.

VALUE	QLD	NSW	TAS
Highest positive time error (seconds)	2.75	2.75	8.32
Lowest negative time error (seconds)	-4.01	-3.94	-11.97